

**IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE**

**TITLE:**

**BOYANCY RESISTANCE EXERCISE SYSTEM**

**INVENTOR:**

**W. Burnell Gates**

09916906-072701

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

## FIELD OF THE INVENTION

[0001] Exercise systems, more specifically an exercise system using the boyancy of a submerged boyant element as resistance for an "in water" exercise.

## BACKGROUND OF THE INVENTION

[0002] Proper exercise is necessary to maintain good health and for proper rehabilitation from injury.

There are many forms of exercise, each with their own advantages and disadvantages. One disadvantage to traditional forms of exercise such as free weight lifting is the tremendous stress which it concentrates on the joints and bones of the user. For the elderly or infirm, focusing pressure on the joints may be debilitating. Often, in such cases, a water borne exercise such as swimming is beneficial. When one is at least partially underwater they enjoy the natural boyancy of the body. Furthermore, exercise underwater, at least partially, will release stress on the participants joints.

[0003] Applicant provides a novel system, including a multiplicity of elements, which will include boyant elements to function, when submerged, as resistance to a user at least partially submerged in water.

[0004] Applicant's system provides the advantages of underwater exercise with the advantages of a free weight system. That is, Applicant's provide the ability to configure an exercise element to conform to the shape and resistance desired by the underwater exercise participant in much the same way as the traditional land borne free weight lifter will remove and change elements, such as a plate, from a mounting system, such as a dumbbell or barbell in order to afford greater or less resistance.

## SUMMARY OF THE INVENTION

[0005] A device for exercising when partially submerged in water. The device includes a dumbbell shaped floatation member for providing boyant resistance once submerged underwater. This dumbbell shaped member can accept extensions on either end thereof. A second dumbbell member and a second pair of extensions is provided. A third component of the boyancy system is a boyancy member that would engage both dumbbell shaped members to provide for a barbell shaped device for submerging underwater and providing boyant resistance for the user to work against. The pairs of extension may be threadably engaged to either end of the barbell member.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded view of elements of Applicant's boyancy system.

Fig. 1A is an exploded elevational view of a dumbbell of Applicant's boyancy system with a pair of extension members for threadable engagement to the removed ends thereof.

Fig. 2 is a cutaway elevational view of extension members of Applicant's present invention showing how two elements of the invention, here for example, two extension members, may threadably engage one another.

Fig. 3 is elevational end view of a dumbbell of Applicant's present invention.

Fig. 3A is an exploded view showing how some of the components of Applicant's present are dimensioned to fit together for shipment and storage.

Fig. 4 is an isometric view with ghosted lines showing the central channels through the center of a dumbbell for engagement with a mounting member.

1 Fig. 4A is an isometric view of an embodiment of Applicant's dumbbell joiner element.  
2 Fig. 5A, 5B, and 5C illustrate the use of a third dumbbell as a dumbbell joiner element and three  
3 of a number of combinations of dumbbells and extensions and joiner elements that may be used to  
4 engage one another to form a barbell.  
5 Fig. 6A, 6B, and 6C illustrate a method of using both the dumbbells and the barbells of Applicant's  
6 present invention for arm exercises while partially submerged in water.  
7 Fig. 7 is a videotape including instructions for putting together and using components of Applicant's  
8 boyancy system.

#### 10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

11 [0006] With reference to the figures it is noted that Applicant's provide a boyancy resistance  
12 exercise system (10) for providing resistance to an at least partially submerged or water borne user.  
13 Applicant's system is typically comprised of at least two (2) primary components: boyant elements  
14 (12) and boyant element mounting members (14).

15 [0007] Boyant elements (12) are comprised of a material that has a specific gravity of less than one.  
16 Such a material will float on water. One such material is ETHAFOAM®, a foamed plastic available  
17 from Don Chemical. In floating on the surface of the water material comprising a boyant element  
18 will displace a mass of water equal to the weight of the element. Force must be applied externally  
19 to submerge the element in the water. Further, a downward force must be applied to maintain the  
20 boyant element underwater. The force required to maintain the boyant element underwater is equal  
21 to the weight of the mass of the water displaced in submerging the floating element. Therefore, for

any given material the greater its volume the greater the boyancy force (force urging the submerged boyant element towards the surface of the water).

[0008] Turning again to the figures it is noted that boyant elements (12) may be dimensioned and shaped to accept a boyant element mounting member (14), such as a cylindrical PVC pipe consisting of multiple threadable engagement portions thereon.

[0009] Applicant's boyancy resistance system is seen in Fig. 1 to have boyant elements (12), some defined or shaped to mimic dumbbells (16) that is, to have traditional enlarged dumbbell end masses (16A) joined by cross members (16B) for grasping with ones hand there between. Here, for example dumbbell (16) may be made from boyant element (12) such as foam or other lightweight floatable material that is shaped to have an extension or cross member (16B) between two (2) removed end portions, the extension having a length and diameter for easy grasping.

[0010] A dumbbell, for example, may be grasped about the cross member (16B) while floating in water. The user may then force it underwater and work against the boyancy force created by the submergence in doing a number of exercise motions such as curls, leg lifts, rowing motion, paddling motion, reverse curls etc. (See Fig. 6A and 6B)

[0011] Applicant's dumbbell and other boyant elements typically has an elongated central channel (16C), coincident with the longitudinal axis defined therein for snug receipt of boyant element mounting member (14), such as a length of PVC pipe, therein. Further, it is seen with reference to the figures that Applicant's boyancy resistance system (10) may include one or more extension members (18) which extension members also comprise boyant element mounting members (14) as part thereof and which may include threaded engagement portions 14A (male and female) to threadable engage portions of the dumbbell or other elements of the resistance system (See Fig. 2).

1 The boyant elements mounting member (14) may be threaded PVC pipe, and any of the separate  
2 elements of the system may include the pipe or mounting member centrally located on a longitudinal  
3 axis thereof adhesively joined to shaped longitudinal cavity therethrough, with ends for threadable  
4 engagement to either the dumbbell or dumbbell joinder element (20).

5 [0012] With referenced to Figs. 1, 5A, 5B and 5C, It is seen now that Applicant's system includes  
6 dumbbells (16) with extensions (18) threadable or otherwise removably attachable thereto which  
7 dumbbells may be used separately and apart from other elements of Applicant's resistance system.  
8 However, the dumbbells may be joined together through a dumbbell joinder element (20) (See Fig.  
9 1) which, like the other elements of the system, is comprised at least partially of a boyant material  
10 that will float and therefor provide a boyancy force resistance to the user as well as boyant elements  
11 mounting member (14) thereon. Also, a third dumbbell may function to join to other dumbbells (See  
12 Figs. 5A-C). In Fig. 1 the dumbbell joinder element is seen to have boyancy element mounting  
13 member extending from paired opposed faces thereof for threadable joining the two (2) dumbbells  
14 to create a barbell (19). The barbell, here created by at least the joinder of dumbbells (16), one on  
15 either side of the dumbbell joinder element (20) may be grasped by the user by the placement of  
16 hands on the cross members (16B) of each of the two (2) dumbbells and used in barbell fashion for  
17 underwater exercise.

18 [0013] It is seen also that Applicant's system may increase the underwater resistance created by the  
19 boyancy force with the addition of one or more extensions (18) to the ends of the barbell (19) created  
20 by the joinder of the two (2) dumbbells to the dumbbell joinder element (20). Also, the extensions  
21 may be placed between the centrally located joinder element and the two dumbbells so as to advst  
22 the width between the barbell users hands. It can be seen that Applicant's system allows the user

to perform a variety of dumbbell or barbell exercises and to modify the buoyancy force resistance created by the dumbbell or barbells by the appropriate addition of extensions.

[0014] Furthermore, it is seen that such a system is compact (See Fig. 3A). More specifically note that the width of the dumbbell joinder element may be just slightly less than the distance between the inner faces of the dumbbell end masses (16A). Furthermore, extensions (18) may be paired together such that the combined width of two will fit snugly within the aforementioned distance between the inner faces of each of the dumbbells so as to provide compact shipment and storage of the system.

[0015] Note in Fig. 1 and Fig. 4A that dumbbell joinder element (20) may contain walls defining a cutout central section (20A). In such an optional preferred embodiment of dumbbell joinder element (20) such walls provide for the easy receipt of the foot portion of the user so as to convert this dumbbell joinder element (20) into a separate element for exercising the lower extremities of the users body. Dumbbell joinder element, however, may take any shape so long as is central between the dumbbell so as to located them.

[0016] Thus, we have seen that Applicant provides in a buoyancy resistance system the following:

1. At least a pair of dumbbells that may be used separately.
2. Dumbbells joinable with a dumbbell joinder element to convert the system into a single barbell utilizing two (2) dumbbells.
3. Dumbbells with the capability of adding on extensions for increase buoyancy resistance.
4. A barbell capable of receiving extensions for increase for buoyancy resistance.
5. A foot or leg engaging element for buoyancy resistance to exercise legs.

1 [0017] Fig. 6A through 6C illustrate a user enjoining the benefits of Applicant's system, partially  
2 submerged in water. Here it is seen that either the dumbbells alone or joined to from a barbell (See  
3 Fig. 6C) may be moved underwater such that a component of the motion is downward (for  
4 movement against the resisting boyancy force). Applicant's also provide a videotape illustrated here  
5 in Fig. 7, to provide instructions for assembly of the components of Applicant's system and also to  
6 provide examples of various exercises that my be done utilizing Applicant's novel system.

7 [0018] While Applicant's system above has been illustrated using floatation elements having a  
8 mounting member, such as PVC pipe, it is also anticipated that Applicant's novel system may  
9 included elements molded with joinder elements integral therein. For example, a hard plastic  
10 waterproof shell may be molded with the air captured inside the shell to provide the boyancy and  
11 with the shell including threaded male and/or female engagements extending from the outer faces  
12 thereof.

13 [0019] Although the invention has been described with reference to specific embodiments, this  
14 description is not meant to be construed in a limited sense. Various modifications of the disclosed  
15 embodiments, as well as alternative embodiments of the inventions will become apparent to persons  
16 skilled in the art upon the reference to the description of the invention. It is, therefore, contemplated  
17 that the appended claims will cover such modifications that fall within the scope of the invention.  
18